

60th Medical Group (AMC), Travis AFB, CA
INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)
FINAL REPORT SUMMARY

(Please type all information. Use additional pages if necessary.)

PROTOCOL #: FDG20150024A

DATE: 5 April 2016

PROTOCOL TITLE: Chest tube versus pigtail catheter drainage of on-going hemothorax in Swine (*Sus scrofa*).

PRINCIPAL INVESTIGATOR (PI) / TRAINING COORDINATOR (TC): Capt Rachel Russo

DEPARTMENT: Surgery

PHONE #: (916) 734-2724

INITIAL APPROVAL DATE: 18 June 2015

LAST TRIENNIAL REVISION DATE: Not applicable.

FUNDING SOURCE: AF Surgeon General

1. RECORD OF ANIMAL USAGE:

Animal Species:	Total # Approved	# Used this FY	Total # Used to Date
Sus scrofa	19	13	13

2. PROTOCOL TYPE / CHARACTERISTICS: (Check all applicable terms in **EACH** column)

<input type="checkbox"/> Training: Live Animal	<input type="checkbox"/> Medical Readiness	<input type="checkbox"/> Prolonged Restraint
<input type="checkbox"/> Training: non-Live Animal	<input type="checkbox"/> Health Promotion	<input type="checkbox"/> Multiple Survival Surgery
<input type="checkbox"/> Research: Survival (chronic)	<input type="checkbox"/> Prevention	<input type="checkbox"/> Behavioral Study
<input checked="" type="checkbox"/> Research: non-Survival (acute)	<input type="checkbox"/> Utilization Mgt.	<input type="checkbox"/> Adjuvant Use
<input type="checkbox"/> Other ()	<input checked="" type="checkbox"/> Other (Treatment)	<input type="checkbox"/> Biohazard

3. PROTOCOL PAIN CATEGORY (USDA): (Check applicable) ☐ C ☒ D ☐ E

4. PROTOCOL STATUS:

***Request Protocol Closure:**

☐ Inactive, protocol never initiated

☐ Inactive, protocol initiated but has not/will not be completed

☒ Completed, all approved procedures/animal uses have been completed

5. Previous Amendments:

List all amendments made to the protocol. IF none occurred, state NONE. Do not use N/A.

For the Entire Study Chronologically

Amendment Number	Date of Approval	Summary of the Change
		"Tab" to add rows.

6. **FUNDING STATUS:** Funding allocated: \$13,808 Funds remaining: \$ 0

7. **PROTOCOL PERSONNEL CHANGES:**

Have there been any personnel/staffing changes (PI/CI/AI/TC/Instructor) since the last IACUC approval of protocol, or annual review? ☐ Yes ☒ No

If yes, complete the following sections (Additions/Deletions). For additions, indicate whether or not the IACUC has approved this addition.

ADDITIONS: (Include Name, Protocol function - PI/CI/AI/TC/Instructor, IACUC approval - Yes/No)

DELETIONS: (Include Name, Protocol function - PI/CI/AI/TC/Instructor, Effective date of deletion)

8. **PROBLEMS / ADVERSE EVENTS:** Identify any problems or adverse events that have affected study progress. Itemize adverse events that have led to unanticipated animal illness, distress, injury, or death; and indicate whether or not these events were reported to the IACUC.

None.

9. **REDUCTION, REFINEMENT, OR REPLACEMENT OF ANIMAL USE:**

REPLACEMENT (ALTERNATIVES): Since the last IACUC approval, have alternatives to animal use become available that could be substituted in this protocol without adversely affecting study or training objectives?

No.

REFINEMENT: Since the last IACUC approval, have any study refinements been implemented to reduce the degree of pain or distress experienced by study animals, or have animals of lower phylogenetic status or sentience been identified as potential study/training models in this protocol?

No.

REDUCTION: Since the last IACUC approval, have any methods been identified to reduce the number of live animals used in this protocol?

No.

10. **PUBLICATIONS / PRESENTATIONS:** (List any scientific publications and/or presentations that have resulted from this protocol. Include pending/scheduled publications or presentations).

Submitted to the Journal of Trauma and Acute Care Surgery. Presented at multiple national meetings.

11. **Were the protocol objectives met, and how will the outcome or training benefit the DoD/USAF?**

Yes. The results indicate that a smaller pigtail catheter is equally effective as a large chest tube for draining blood from the chest cavity.

12. **PROTOCOL OUTCOME SUMMARY:** (Please provide, in "ABSTRACT" format, a summary of the protocol objectives, materials and methods, results - include tables/figures, and conclusions/applications.)

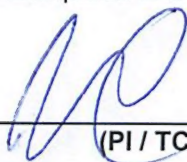
Background: Evacuation of traumatic hemothorax (HTx) is typically accomplished with large bore (28-40F) chest tubes which often result in patient discomfort. Management of HTx with smaller (14Fr) pigtail catheters has not been readily adopted due to concerns about tube occlusion and blood evacuation rates. We compared pigtail catheters with chest tubes for the drainage of acute HTx in a swine model.

Methods: Six Yorkshire-cross swine (44 – 54 kg) were anesthetized, instrumented, and mechanically ventilated. A 32F chest tube was placed in one randomly assigned hemithorax; a 14F pigtail catheter was placed in the other. Each was connected to a chest drainage system at -20 cm H₂O suction and clamped. Over 15 minutes, 1500 mL of arterial blood was withdrawn via femoral artery catheters. Seven hundred-fifty milliliters of the withdrawn blood

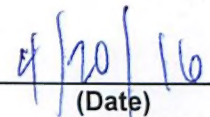
was instilled into each pleural space, and fluid resuscitation with colloid was initiated. The chest drains were then unclamped. Output from each drain was measured every minute for 5 minutes, then every 5 minutes for 40 minutes. The swine were euthanized and thoracotomies were performed to quantify the volume of blood remaining in each pleural space and to examine the position of each tube.

Results: Blood drainage was more rapid from the chest tube during the first three minutes compared to the pigtail catheter (348 ± 109 mL/min vs. 176 ± 53 mL/min) but this difference was not statistically significant ($p=0.19$). Thereafter, the rates of drainage between the two tubes were not substantially different. The chest tube drained a higher total percentage of the blood from the chest (87.3% vs 70.3%), but this difference was not statistically significant ($p=0.21$).

Conclusion: We found no statistically significant difference in the volume of blood drained by a 14F pigtail catheter compared to a 32F chest tube.



(PI / TC Signature)



(Date)

Attachments:

Attachment 1: Defense Technical Information Center (DTIC) Abstract Submission (**Mandatory**)

Attachment 1

Defense Technical Information Center (DTIC) Abstract Submission

This abstract requires a brief (no more than 200 words) factual summary of the most significant information in the following format: Objectives, Methods, Results, and Conclusion.

Background: We compared pigtail catheters with chest tubes for the drainage of acute HTx in a swine model.

Methods: Six Yorkshire-cross swine were anesthetized, instrumented, and mechanically ventilated. A 32F chest tube was placed in one randomly assigned hemithorax; a 14F pigtail catheter was placed in the other. Each was connected to a chest drainage system at -20 cm H₂O suction and clamped. Seven hundred-fifty milliliters of the withdrawn blood was instilled into each pleural space, and fluid resuscitation with colloid was initiated. Output from each drain was measured every minute for 5 minutes, then every 5 minutes for 40 minutes.

Results: Blood drainage was more rapid from the chest tube during the first three minutes compared to the pigtail catheter (348 ± 109 mL/min vs. 176 ± 53 mL/min) but this difference was not statistically significant ($p=0.19$). Thereafter, the rates of drainage between the two tubes were not substantially different. The chest tube drained a higher total percentage of the blood from the chest (87.3% vs 70.3%), but this difference was not statistically significant ($p=0.21$).

Conclusion: We found no statistically significant difference in the volume of blood drained by a 14F pigtail catheter compared to a 32F chest tube.

Grant Number: _____

From: _____

****If you utilized an external grant, please provide Grant # and where the grant came from. Thank you.**